The Rök Runestone
PTA-Examination of the Novel Proposal

Inger Bierschenk

2022   No. 164

Copenhagen University
Denmark

KOGNITIONSVETENSKAPLIG FORSKNING

Cognitive Science Research

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Abstract   The rune stone at the church of Rök in Östergötland, Sweden (about 800), has been subject to interpretations and speculations ever since it was discovered in the early 1600s. The reason for the great interest it has among researchers and antiquarians is that it is regarded as the world's longest runic inscription and as the start of Swedish literary history. The interpretations of the meaning in the runes and the purpose of the inscription have varied, partly depending on the researcher's field and partly on the spirit of time. The novel proposal for interpretation of the Rök stone has recently been presented in the context of geo-archaeology. It has now been examined with the method PTA/Vertex, which is based on the Agent-action-Objective Axiom. As an initial step, PES-graphs were produced, showing the textual space evolution. Thereafter, FES-graphs were produced, showing the density of the string combinations and their fusion into information energy clusters. The Swedish research group that came up with the novel solution argues that the theme of the inscription is about anxiety for a climate crisis. The present study was aimed at examining the hidden conceptual structure inherent in the novel interpretation. The Orientation, representing the theme, concentrates in *Authenticity,* which in this structure indicates a conflict between an external and an internal world. The Intention, representing the motive, concentrates in *Necessity*.

This study is the second analysis of the flow dynamics and topology of the Rök runestone. The idea of the first study (I. Bierschenk, 2021) was to test whether the method Perspective Text Analysis (PTA, version Vertex) would work on runic text. Since it has been proved that the method is applicable for runes, the present study will examine the flows and fusions of a recently presented different approach to interpreting the rune inscription on the Rök stone (Holmberg et. al., 2018-2019). But first a brief introduction to the theme.

For one and a half century, rune researchers have studied the Rök runestone in detail from linguistic, literary and historical points of view and with varying methodological approaches. The traditional (standard) interpretation, which is advocated by the Swedish National Heritage Board, is essentially based on Wessén (1958), Jansson (1953) and Gustavson (1991). Since a few decades, the general conception has been that the inscription is about riddles, a kind of literary genre, where the riddles can be interpreted as allusions to sagas and myths from the Old Scandinavian literature, which were possibly lost and therefore remain enigmatic. The group of representatives of that interpretation among Swedish researchers includes Lönnroth (1977), Ralph (2007) and Holmberg (2015). Ralph considers the riddle itself to be the solution. According to him, the formulations on the stone are codified underlying meanings. He shows how a completely novel interpretation can be obtained by re-segmenting the rune sequence and he takes the most debated part of the text as an example. The so called Tjodrik strophe has traditionally been conceived to be about the ostrogothic army leader Theodoric the Great. The rune carver portrays him sitting on horseback similar to the statue of Theodoric, which during the reign of Charlemagne had been moved from Ravenna to Aachen in 801. However, the name of the warrior does not have to be interpreted literally as Theodoric.

Ralph shows that the character combination traditionally read as 'Tjodrik ruled' can be re-segmented as 'A man rode a horse'. Such a change in interpretation has great effects on the assessment of the entire monument.

The latest interpretation of the message on the stone is the one offered by Holmberg, et al., (2018-2019). According to the authors' theory, the stone is not at all about heroic deeds and similar ideas about Viking Age but about the end of the world due to a climate catastrophe that has occurred. Their theory was widely spread in 2020. Many readers of the announcement adopted the challenging solution immediately, while others were sceptical, even dismissive, as for example Lönnroth (2020). Although Lönnroth admits the fascination with the novel interpretation, he judges that there is nothing in the text to indicate that it is about what the researchers claim and especially not about the climate.

The present study comes with a new method, which is developed to produce the dynamics of a grapheme flow and the topological relations in a text production, which disclose the structural energy of the text. My aim is to let the method produce the textual flow of the novel interpretation presented by Holmberg and his colleagues and to uncover its structural implications in the form of empirically derived concepts. Because of basic differences between the old and new segmentation of the runic materials, comparisons will not be made between the present results and the previous analysis. Should the reader like to study contrasts nonetheless, please consult the graphs in Appendix 2 or the entire report (I. Bierschenk, 2021).

The Rök stone in novel interpretation

The text with its English translation is taken from Holmberg, et al. (2018-2019, p. 20). The font in bold is a transliterated form of Early Old Norse, which is modernized in spelling and uses punctuation largely. This version of Old Norse was used for the PTA analysis. Apparently, the novel interpretation connects to the research that assumes that the text presents enigmatic questions. However, the answers are not included in the analysis.

Aft Vāmōð stānda rūnaʀ þāʀ. Æn Varinn fāði, faðiʀ, aft faigiãn sunu. (After Vāmōðʀ stand these runes. And Varinn, the father, made them after the death-doomed son.)

Sagum Ygg minni þat, hværiaʀ valrauƀaʀ vāʀin tvāʀ þāʀ, svāð tvalf sinnum vāʀin numnaʀ at valrauƀu bāðaʀ sãmãn ã̃ ȳmissum mãnnum?

(Let us say this as a memory for Yggʀ, which spoils of war there were two, which twelve times were taken as spoils of war, both from one to another?)

Answer: The Sun and the Moon

Þat sagum ãnnart, **hvā'ʀ fur nīu aldum ã̃n urði fiaru meðr hraiðgutum, auk dǿmiʀ æ̃ nn umb sakaʀ? Raið iau, rinkʀ hinn þurmōði, stilliʀ flutna, strãndu Hraiðmaraʀ. Sitiʀ nū garuʀ ã̃ guta sīnum, skialdi umb fatlaðʀ, skati mǽringa.**

(This let us say as second, who nine generations ago lost their life with the Hraiðgutar [i.e. in the east]; but still decides the matter? Ride the horse did the bold champion, chief of men, over the shores of the Hraiðsea [i.e. over the eastern horizon]. Now he sits armed on his horse, his shield strapped, foremost of the famous.

Answer: The Sun

Sagum Ygg minni þat, hvā'ʀ ī gyldinga vāʀi guldin at kvã̃naʀ hūsli?

(Let us say this as a memory for Yggʀ, who because of a howler [i.e. wolf] has suffered through a woman's sacrifice?)

Answer: The Sun

Þat sagum tvalfta, hvar hæstʀ sē gunnaʀ etu vēttvãngi ã̃, kunungaʀ tvaiʀ tigiʀ svāð ã̃ liggia?

(This let us say as twelfth, where the horse of the battle [i.e. the wolf] sees food on the battlefield, where twenty kings lie?

Answer: On the battlefield of Ragnarök

Þat sagum þrēttāunda, hværiʀ tvaiʀ tigiʀ kunungaʀ sātin at Sīulundi fiagura vinddura at fiagurum nampnum, burniʀ fiagurum brø̄ðrum? Valkaʀ fim, Rāðulfs syniʀ, Hraiðulfaʀ fim, Rōgulfs syniʀ, Hā̄̄īslaʀ fim, Haruðs syniʀ, Gunnmundaʀ fim, Bernaʀ syniʀ. En Ygg m[inni] … (partly illegible)

(This let us say as thirteenth, which twenty kings were at the Grove of Sparks [i.e. the battlefield] in four directions, of four names, born of four brothers? Five Valkis, sons of Rāðulfʀ, five Hraiðulfʀs, sons of Rōgulfʀ, five Hā̄īsls, sons of Haruðʀ, five Gunnmundʀs, sons of Bern. And for Yggʀ a m(emory) … … (partly illegible))

Answer: The warriors of Oden

Sagum Ygg minni: þor! Siþi vīaværi?

Let us say a memory for Yggʀ, dare! [Who is] a protector of sanctuaries for a brother?

Answer: The Sun

Ōlni rȳðʀ?

[Whom] does the ravager [i.e. the wolf] redden with blood?

Answer: The Sun

Sagum Ygg minni,

(h)vaim sē burinn niðʀ, drǣ ngi! Villi nē's þat.

Let us say a memory for Yggʀ, to whom is born an offspring, to the young man! It is not a lie.

Answer: Oden

Knūã knātti iatun? Villi nē's þat.

(H)nit.

[Who] could beat a giant? It is not a lie.

Answer: Vidar

Clash!

In the PTA analysis, the verb has priority over the adjective, because it creates depth. Here follow some comments regarding the identification of verbs. For the references without year, I refer to Swedish Wikipedia article (link in References). The word **faigiãn** has sometimes been translated with variants of a longer phrase with verb conjugation, 'addicted to death' (von Friesen) or 'consecrated to death' (Ohlmarks). Brate and Wessén use the simpler 'dead'. Holmberg et al. choose the meaning 'marked by death', in their English version (2018-2019) 'death-doomed', which is a broad interpretation. In the present study, faigiãn is used as the adjective 'dead', according to the runic word register (Peterson, 2006). The word **garuʀ** is usually translated with the participle form 'armed'. Also Wessén (1965/1968, p. 129) cites the form as possible with an example from a medieval provincial law, although it refers to a later period. Peterson (2006) lists in the runic word register *gorr* as only adjective with the meaning 'ready'. Consequently, it is not considered a verb form in the analysis. The phrase **skialdi umb fatlaðʀ** was given in the older translations the meaning 'shield with strap attached' (Brate), 'with strap-attached shield' (von Friesen), which may be grammatically motivated. Later translators seem to envision the rider/warrior and use the phrase 'with the shield in a strap' (Wessén, Ohlmarks) and 'with a shield over the shoulder' (Gustavson, 1991), where the sense of verb disappears. Holmberg et al. uses 'with the shield strapped' (English version 'his shield strapped') i.e. as a participle. According to Peterson, *fatlaflR* is a participle of the verb *fatla*, 'to bind' and is therefore used as a verb in the analysis. The word **sē** in *sē burinn* has been encoded as verb (is born).

Towards the interior of the text

Perspective Text Analysis (PTA/Vertex) is the method to be used. The method, which is based on the AaO axiom, has been developed to examine the internal dynamics of texts, which means the invisible, such as energy or intentionality. The method is related to string theory and the mathematics that has been developed for calculating distances in space as well as it has

some connections with the discovery of topological phase transitions. In this way, it includes both a language theory and a theory of text (see, e.g., B. Bierschenk, 1993/2013, 2011; I. Bierschenk, 1999/2003; 2011; I. Bierschenk & B. Bierschenk, 2004, 2011).

To consider text as energy flow means that something must create forward movement. The verb has this function. A natural flow runs with resistance, irregularities and swirls. The dynamics are created by the components Agent [A], which has its place before the verb, and Objective [O], which has its place after the verb (concerning the terminology, see my comment at the bottom of the page). The locations are fixed and independent of semantics. They are intertwined during the text movement, but through the mirror technique of keeping them apart, it is possible to study them separately (Greene, 1999, p. 278) without losing their cooperation. The functional clause (FC) (I. Bierschenk, 1992, 1999/2003, 2011), represented by the AaO-unity, may consist of both material and immaterial (virtual) strings at both sides of the verb. The strings are measured with magnitudes (not quantities). In the case where the string is virtual, a dummy (Ø) must indicate that a magnitude value should be inserted. The value, which depends on the textual environment (B. Bierschenk, 2011) is taken from the previous FC to (A) and from the subsequent FC to (O). The supplementation, which takes place in a rhythmic and commuting motion, causes the positions to include values from both components. The environment that governs the determination of magnitudes is defined by punctuation. An FC has only one verb, so each verb form (including auxiliary verb and participle) implies two Therefore, several FC can exist between punctuation and the unit is called interval. Intervals are used for the graphical representation. Since the flowing energy is the basis for the conceptual analysis, it is presented first.

Flow Dynamics of the Novel Proposal

PES-graphs (PES=Potential Energy Surface) have been created with the program system SigmaPlot (2014, version 13.0), which shows the space of the Agent and Objective separately. The mirror technique means that the dependence between the components is maintained. Figure 1 depicts the Agent and Objective flows. The x-axis represents the number of agent variables and objective variables per interval, the y-axis represents the intervals and the z-axis represents the angular values (radians). For basic data, see Appendix 1, Table A1.

The depiction shows the distribution within the Agent and the Objective, respectively. The Agent is usually less mobile than the Objective, partly because a text agent can control several objective variables in the same clause, in which it is repeated in the form of a copy. It makes the movements slow and creates a smooth surface with smooth transitions. Example of repetitions that give the slow flow are found especially in the intervals nine, nineteen and twenty-three, where the agents are more than two with equal values. The distinct punctuation is an addition to the original runic text that affects the dynamics of the flow. A natural text is usually quite dynamic and the components relate asymmetrically to one another. This is not the case here. The surface does not show any clear wave motions and the surface motions that still occur in A and O look very similar, due to the fact that the variation in magnitude between the variables is similar. Moreover, the marked spikes in the foreground, which can be seen in both graphs, have arisen where the values that are compared differ greatly. The high wave at the end of the Agent expresses the difference between the values (1.5181 and -0.8271) in the penultimate interval and the repeated value (3.6110) in the last interval.

Comment: Agent is the one / that which controls the forward movement of a flow. Objective is the one / that which lies in the agent's direction. In contrast to Object, which has a static meaning, Objective denotes an oscillating entity. A and O interact through clock-like pendulum moves. To denote variables, lower-case initials are used.
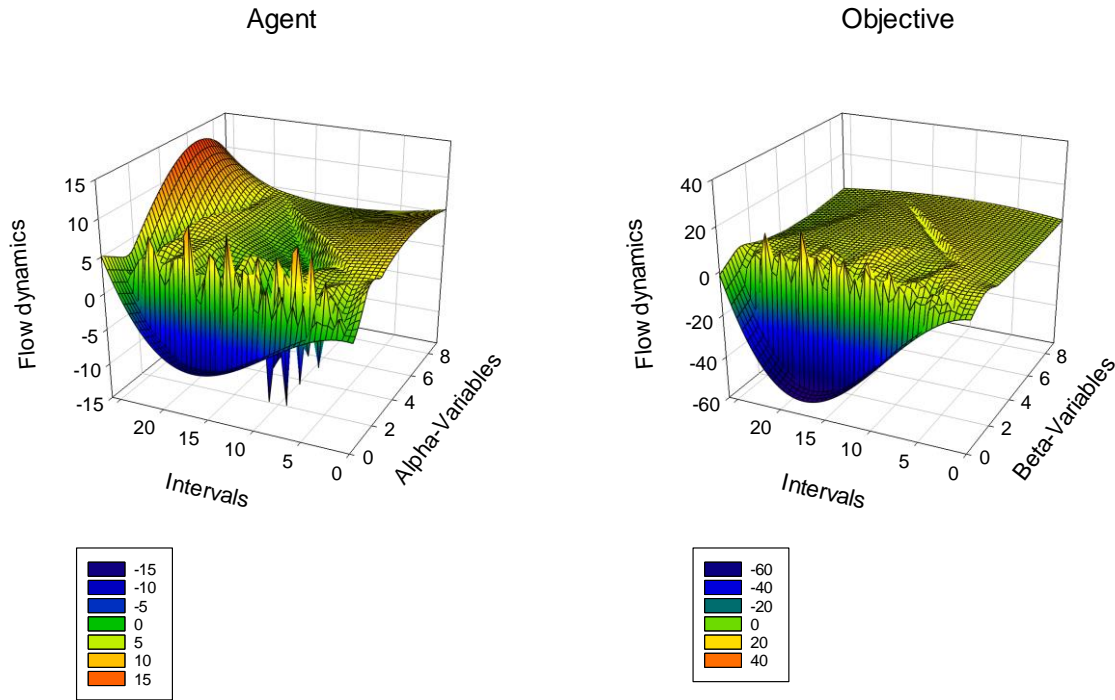
Agent

Objective

Figure 1 *Flow dynamics of the Rök stone: novel proposal*

We will now take a closer look at some distinctive strings that lie beneath the patterns. The deepest place of the Agent (-7.5454) occurs in the tenth interval, where two variables on the objective side are found, so the value is repeated. It is formed by the introductory phrase (. *Ø$_A$ Sitiʀ nū garuʀ …).* An explicit agent variable is missing here, which has its roots in the previous FC, which in turn contains an agent dummy. The root is thus drawn in several stages and added to the objective variable in the immediately preceding FC (*Raið iau, …Hraiðmaraʀ.*). There are no distinctively high magnitudes in the Agent. The highest (4.5406) is found in the seventh interval, which is the text place (*…, hvā'ʀ fur nīu aldum ãn urði …*). In this case, an explicit string sequence has produced a relatively high value.

The deepest value of the Objective appears in the interval twenty-five (-4.9719), which corresponds to the text place (. *Ø$_A$ Knūã Ø$_O$ * Ø$_A$ knātti iatun),* where the asterisk marks a sentence boundary. The O-dummy after the first verb takes the subsequent A-dummy (which includes the previous A-dummy) plus the objective variable. The maximum value of the Objective (7.7558) is in the thirteenth interval and corresponds to the text place (*… guldin at kvãnaʀ hūsli?*). The string gets relatively high values depending on the base value of the component, which is raised depending on the differentiation that takes place through the preposition (B. Bierschenk, 2011). The runic word register (Peterson, 2006) states **at** as a preposition governing dative with the meaning 'on, at: to, such as'. PTA does not work with grammatical case but encodes prepositions according to three types: on, with and for. They take base values in ascending order connecting to a theory of language evolution (I. Bierschenk, 1999/2003). Holmberg et al.'s interpretation is 'got to pay for', which gives a higher value in the PTA system than 'was paid by', used by Brate and Wessén. The analysis chosen is of the type with (which includes by and through) and lies between the lowest and the highest value for differentiation of an objective variable.

Fusion Dynamics of the Novel Proposal

In the second step of the analysis, a fusion of the grapheme strings takes place based on distance, which creates concentrations of information. The concentrated points, the attractors, form a network, which the graph program presents as a geometric landscape with the help of FES-graphs (FES=Free Energy Surface). The attractors are then named after the empirical relationships that created them. The components (dimensions) of the concentration, which are intangible, are Intention, controlled by the Agent component, and Orientation, controlled by the Objective component. The Intention is hidden in the Orientation and cannot be observed until the Orientation is clear. Therefore, the Orientation is presented first. Also in this step, a separate landscape description is made.

Concentrated energy in the Orientation

Figure 2 shows the Orientation landscape. The shape is divided into a lowland and a highland region. The lowlands have no profiled minor hills, while the mountain massif has a high and sharp ridge with marked peaks. Here the effects of the broken flow can be seen in such a way that there are several peaks close to each other, which indicates small steps between the fusions.
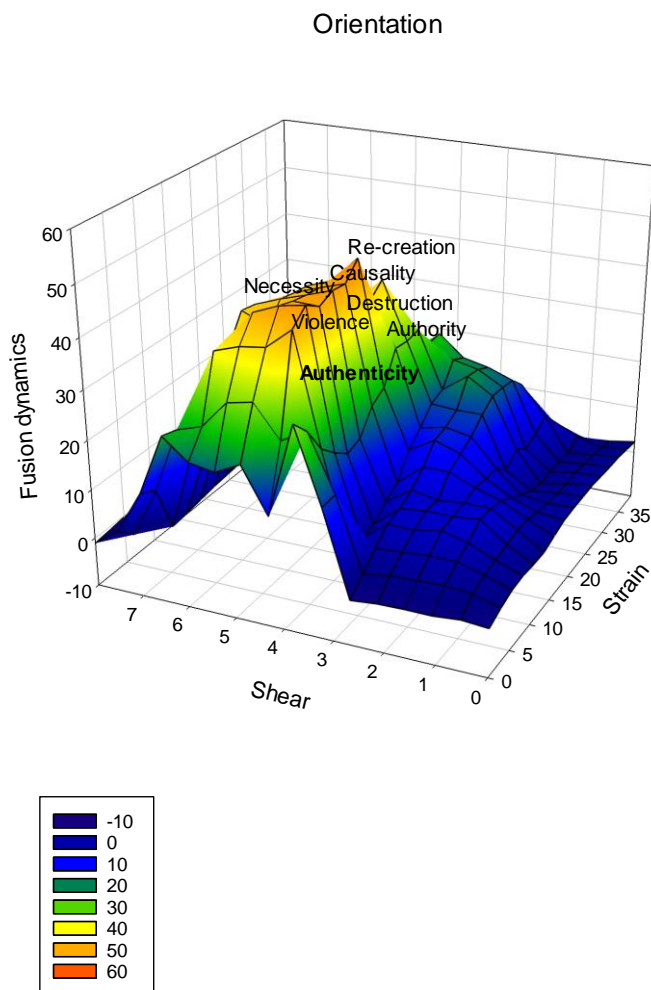
Figure 2   *Orientation of the Rök stone: novel proposal*

The presentation of the concepts and their relations will follow Table A2 in Appendix 1. The Old Norse strings have been supplied with the Swedish translation made by Holmberg et al (GU, 2020).to facilitate the naming. As Table A2 shows, the texture characteristics discussed above has contributed to a large number of mergers, several of which are aspects of each other. For that reason, the values are very close with a difference of only a decimal, and thus the descriptions are intertwined. Due to the strong concentration, the placement of the names in the graph becomes approximate. The number of concepts that will be included in the description has been limited to the ones that have been highlighted in Figure 2 and their close relationships. The description begins with the fusion that lies along the mountainside, to progress until it reaches the end, where the lowest attractor merges with a higher lying one to stop in the final concept.

Table 1 *Transformation of T_{58} through T_{57} into T_{59}*

13	7	T_{58}	8,2582	*Vilja (Will)*
15	5	T_{57}	208,0628	*Källa (Source)*
13	**5**	**T_{59}**	**216,3210**	**Auktoritet (Authority)**

Authority includes among other meanings power, influence and government. It indicates a social relationship in which one person or group has influence over another person or group. As a personality trait, it is a matter of the ability to convince others of a position or persuade others to act along certain lines. In this context, it is about a person who has gained respect because of his physical *Strength* and his *Will* to fight against such evil forces that no one else has enough power to perform. This kind of authority is related to a specific *Source* whose *Origin* is of a sacred nature. Authority therefore stands for the natural primordial power of a person who has been given the task of destroying, which means that the purpose is good.

Table 2 *Transformation of T_{60} through T_{59} into T_{61}*

11	7	T_{60}	0,8164	*Anonymitet (Anonymity)*
13	5	T_{59}	216,3210	*Auktoritet (Authority)*
11	**5**	**T_{61}**	**217,1374**	**Våldsutövning (Violence)**

Violence means the intentional use of physical or psychological force for example with the purpose to injure, abuse, damage, destroy or kill. Violence can be used against single persons or groups or even against oneself. In the present context, the concept of *Authority* is a basic aspect of violence. This means that the violence is carried out on someone's behalf. Violence and *Anonymity* are intertwined throughout the history of war in such a way that soldiers learn to cope with killing if they can shift responsibility for their actions to a collective level. In the same way, someone responsible can bring about the desired use of violent force by having enough authority to get others involved. Here, it concerns a person with an unusual ability to influence others to great deeds, and his way of performing violence is highly admired.

Table 3 *Transformation of T_{62} through T_{61} into T_{63}*

9	7	T_{62}	0,7850	*Död (Death)*
11	5	T_{61}	217,1374	*Våldsutövning (Violence)*
9	**5**	**T_{63}**	**217,9224**	**Förstörelse (Destruction)**

Destruction includes both the act of destroying and pta effect of this act, but also the cause or means, such as weapons that can imply the destruction of humanity. Destruction is talked about

primarily when it comes to an environment whose conditions for continued development and survival have been slowed down due to war or natural disasters. In this context, the destruction is caused by *Violence* performed by one or more forces equipped with authority. The *Death* that becomes the main effect of the destruction means that the destruction is a *Massacre* on a battlefield, which in the situation in which it occurs is seen as a mass extermination of people and generations. However, since such destruction is not destined to last forever, and since it is linked to the authority whose *Source* is known, there is a belief in a re-creation.

Table 4 *Transformation of T_{64} through T_{64} into T_{65}*

7	7	T_{64}	0,7046	*Härkomst (Lineage)*
9	5	T_{63}	217,9224	*Förstörelse (Destruction)*
7	**5**	**T_{65}**	**218,6270**	**Återskapande (Re-creation)**

Re-creation means the state or the moment when something has been created again or is being created again, which presupposes that this something has existed, has been destroyed and has returned in the same form or with the same conditions as before. *Destruction* is part of and a prerequisite for re-creation. In this context, the re-creation does not take place automatically; someone has to initiate it. Here the person returns with the mandate to destroy the evil, which is expressed through divine *Lineage*. Its origins also make it possible to see violence as an art and a necessity to re-create something lost. Without the descent of this *Highborn* with natural capacity to use force, re-creation would not take place.

Table 5 *Transformation of T_{66} through T_{65} into T_{67}*

5	7	T_{66}	-0,0345	*Vållande (Cause)*
7	5	T_{65}	218,6270	*Återskapande (Re-creation)*
5	**5**	**T_{67}**	**218,5925**	**Kausalitet (Causality)**

Causality means that there is an inevitable dependence between worldly things and events. Such a necessary relationship is expressed in scientific laws, which in turn are based on the laws of nature. Transformed into a human imaginary world, causality means that nothing natural arises by itself but has an invisible predecessor. A common perception in Eastern cultures, as also in some primitive cultures, is for example, that what a person does in life causes a positive or negative effect in future lives. The event that through *Re-creation* is built into causality is linked to the story of a battlefield and the war penalty to which one side was determined, which is expressed in *Cause*. The effect is some kind of elimination or destruction, which ends in an inevitable re-creation. The events that led there are necessarily evil but at the same time good.

Table 6 *Transformation of T_{68} through T_{67} into T_{69}*

3	7	T_{68}	-0,3058	*Cirkulering (Circulation)*
5	5	T_{67}	218,5925	*Kausalitet (Causality)*
3	**5**	**T_{69}**	**218,2867**	**Nödvändighet (Necessity)**

Necessity means action or situation that arises due to need. Circumstances can be physical or moral compulsion, unavoidable need or the like. The concept of necessity has a wide range of meanings from the logical conditions of philosophy to military necessity, such as emergency law. In all these laws and rules invented by humans, there are situations where the rules can be broken by inner or outer necessity. *Causality* has, as stated above, a meaning of inevitability.

This is the essential aspect of necessity. *Circulation* comes from the booty that wandered twelve times between men or families. It can stand for an unavoidable act that is conditioned culturally and socially, a tradition at the end of the war, for the same reasons as capture. The necessity of nature means the condition that something is necessary according to the laws of nature. In this context, one could see the aspects of causality and circulation as if the concept of necessity has a cosmic meaning. In that case, circulation as deeply embedded is a matter of a rhythm of life that characterizes the immediate living circumstances within a narrow cycle.

Table 7 *Transformation of T_{70} through T_{69} into T_{71}*

1	7	T_{70}	-4,07188	*Sanningshalt (Veracity)*
5	5	T_{69}	218,2867	*Nödvändighet (Necessity)*
1	**5**	**T_{71}**	**214,21482**	**Äkthet (Authenticity)**

Authenticity is most often used in the case of assessment of whether an object is an original or a forgery or copy. An authentic person is characterized by naturalness and genuineness in mentality and emotions, for example through undisguised behaviour. A partial meaning of authenticity is credibility. The name chosen for the credibility aspect is *Veracity*, which lies deep in the orientation and involves a grading of what is true. Veracity emanates from a genuine attempt to confirm that the story of the highborn giant killer is true. In regarding *Necessity* as having a strong influence on veracity means that truth is under threat or put to debate. To claim the reality in this story thus is a necessity for the evil to be defeated. Therefore, necessity as an operator can mean a world order that must not be disturbed and is a tribute to the one who is meant to restore the order. Finally, in authenticity is expressed the consensual concept for the entire theme. It articulates the merge between the external and the internal world, which should be seen as a state of conflict.

Concentrated energy in the Intention
The intention according to a PTA/Vertex analysis is not the same as the intention of the text producer. Intentionality in the systemic sense is driven by the Agent, the component that is responsible for the formation of perspective. The author (or translator/interpreter) is not aware of an intention in that sense. By the operation of the textual intention, it emerges which of the attractors of the orientation that are essential in the perspective.

Figure 3 shows the intention landscape. All extractions are given in Appendix 1, Table A3. As can be expected, the intention displays a restricted perspective. This is illustrated by the fact that the shape of the graphs is similar in orientation and intention and that the concepts in the orientation reappear as aspects of them.

Anonymity has the highest value, which means that it is in absolute focus in the perspective. Together with *Authority*, it forms the origin of violence in the orientation. It emphasizes the importance of the violence used, as it leads to re-creation. *Highborn* and *Divinity* underline that this group of concepts has to do with the deity who is responsible for the good violence that is initiated. In comparing the two graphs, the overall impression is that the orientation expresses the violence theme and the necessity of a disaster to reach re-creation. The intention on the other hand expresses the personalized initiation of these events, which includes *Cause* that involves some kind of accountability. *Necessity* in being the most valuable aspect of authenticity emerges in the intention as the most integrated concept. Here it is related to *Faith*. In the circumstances, it is necessary to have faith in the gods, otherwise the known order of life would be overthrown. *Authority* and *Necessity* expose doubleness in their emergence, thus reflecting the mirror-like relationship between theme and motive.
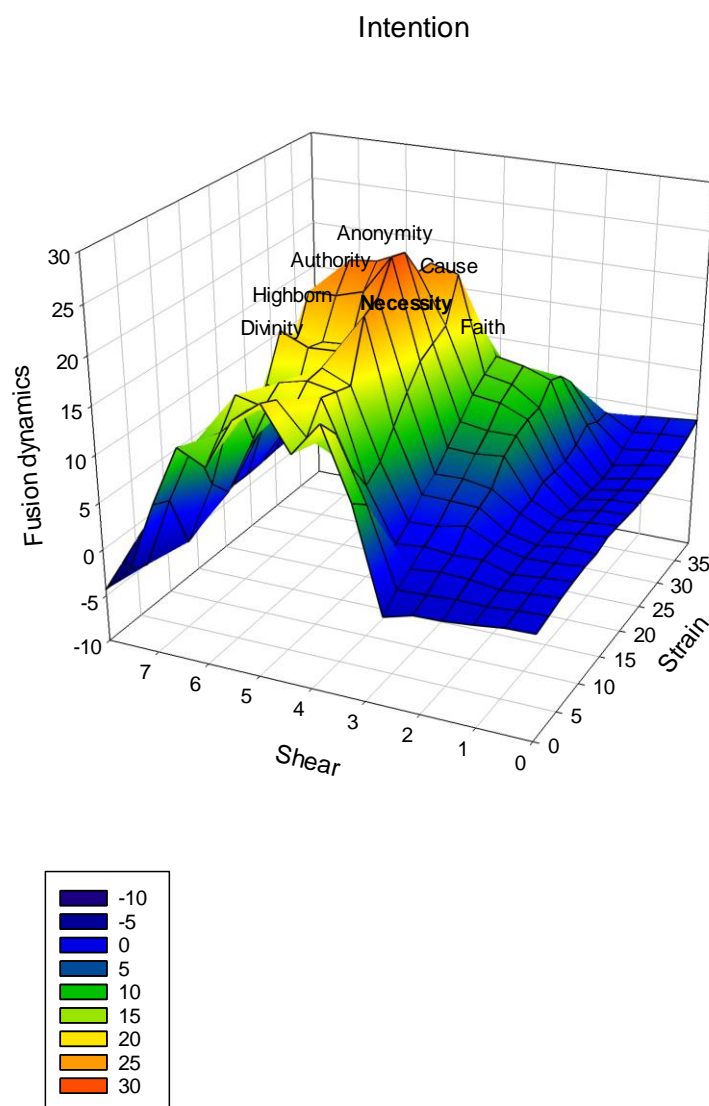
Figure 3   *Intention of the Rök runestone: novel proposal*

Discussion

I would like to make a few comments on the effects of the method. As could be observed, an adaptation of a text through an overly clear punctuation is of course valuable to facilitate reading but results in a fragmented texture. The effect is a rigid flow, which has become evident in this interpretation of the Rök runestone. Asymmetry between Agent and Objective in the same text, which is normal in natural texts, also seems to have been lost through the processing. The texture is an indication of what the structure may look like. For a structure to appear, the information in the strings needs to be processed, which involves a clustering procedure that shows where in the structure information energy is concentrated. It has become obvious that the structure has been affected by the fragmented surface in such a way that the fusional steps take place at small distance due to many and short string sequences, which in turn means that the names of the attractors are very close to each other.

In their abstract, Holmberg et al. (2018-2019) propose that the inscription is about an anxiety activated by a son's death and the fear of a new climate catastrophe similar to the one that occurred after 536 CE. The authors give a thorough account of the support that this catastrophic background provides for interpreting the runic inscription. One should bear in mind, however, that the proposal is based on extra-textual information, interpreted within a symbolic context of Scandinavian mythology. It should be emphasized that PTA/Vertex is a method for structure analysis and thus it does not pretend to contribute to interpretation. The examination by PTA is based on the cooperation of manifest and virtual strings. Thus, the description of the empirical context of the concepts follows their relations such as they have emerged through the methodological procedure. With this prerequisite, the concepts presented are related to the mourning of a dead son. The framework for the mourning emerges as the re-creation of a destroyed world and the violence that must be used by the godlike person in this restoring mission.

Speaking to the gods was already in antiquity an activity that required special knowledge of the language to be used, which was poetry. The frequently debated Theodoric phrase has particular poetic qualities and thus a ritual function. Holmberg et al. discuss the relationship between narrative and ritual and suggest (p. 9) that this phrase has both functions. The PTA-examination has shown that the relationship applies to the entire inscription. In comparing the Figures 2 and 3, it becomes obvious that the orientation collects concepts mostly belonging to the narrative sphere, while the intention adds some mental concepts to the structure, belonging to the worship ritual.

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Appendix 1

Table A1
Magnitudes: novel proposal of the Rök runestone

Variables	X	Y	Z(A)	Z(O)
1	0	0	0	0
2	1	1	3,0208	4,8670
3	1	2	2,0096	4,7413
4	2	2	4,3731	5,4954
5	1	3	3,408804	5,2752
6	1	4	4,2704	4,8042
7	1	5	2,2765	-0,3058
8	2	5	3,991193	6,8112
9	3	5	3,991193	5,9985
10	1	6	3,5482	4,1134
11	1	7	5,0902	6,0964
12	1	8	3,835714	3,9878
13	2	8	3,835714	3,2568
14	1	9	0,996835	3,9878
15	2	9	0,996835	4,9298
16	3	9	0,996835	4,5216
17	4	9	0,996835	4,9926
18	1	10	-7,545370	4,4588
19	2	10	-7,545370	5,4180
20	1	11	3,4606	4,8036
21	1	12	-1,169590	4,8983
22	1	13	2,4178	0,0345
23	2	13	3,945072	7,7558
24	1	14	3,5482	4,1448
25	1	15	2,1980	4,9926
26	2	15	2,1980	4,1071
27	1	16	2,8888	0,8164
28	1	17	3,5482	4,5216
29	1	18	2,7475	6,8565
30	2	18	2,7475	6,9237
31	1	19	4,447441	5,0868
32	2	19	4,447441	4,0506
33	3	19	4,447441	4,4902
34	4	19	4,447441	4,5216
35	5	19	4,447441	4,4902
36	6	19	4,447441	4,4273
37	7	19	4,447441	4,4588
38	8	19	4,447441	4,5216
39	9	19	4,447441	4,8042
40	1	20	4,3960	4,1134
41	2	20	4,3960	4,2390
42	3	20	4,3960	4,3332
43	1	21	3,5796	0,7850
44	1	22	2,722015	4,5843
45	1	23	3,9564	0,7045
46	2	23	3,510930	4,0820
47	3	23	3,510930	4,3332
48	1	24	3,6110	4,3332
49	1	25	1,518103	-4,0718
50	2	25	-0,8271	4,4273
51	1	26	3,6110	4,3332
52	2	26	3,6110	3,9250

Table A2

Transformations of beta-variables: novel proposal of the Rök runestone

X	Y	Node	Value	Transformation
0	1	D	0	
1	0	2	4,8670	stãnda rūnaʀ þāʀ (står dessa runor)
1	**1**	**T₁**	**4,8670**	**Stele, Testamente (Stele, Testament)**
2	0	3	4,7414	fãði, faðiʀ, (ristade, fadern,)
3	0	4	5,4954	aft faigiãn sunu. (till minne av den dödsmärkte sonen)
3	**1**	**T₂**	**10,2368**	**Minnesmärke (Memorial)**
1	*1*	*T₁*	*4,8670*	*Stele (Testamente)*
3	*1*	*T₂*	*10,2368*	*Minnesmärke*
3	**2**	**T₃**	**15,1038**	**Monument (Monument)**
4	0	D	0	
5	0	5	5,2752	sagum Ygg minni þat, (Låt oss säga detta som ett minne för Oden)
5	**1**	**T₄**	**5,2752**	**Vördnad (Reverence)**
5	*1*	*T₄*	*5,2752*	*Vördnad*
3	*2*	*T₃*	*15,1038*	*Monument*
5	**2**	**T₅**	**20,3790**	**Kultplats (Place of worship, Sanctuary)**
6	0	D	0	
7	0	6	4,8042	vāʀin tvāʀ þāʀ, ((vilka) de två var)
7	**1**	**T₆**	**4,8042**	**Parrelation (Binary relation)**
7	*1*	*T₆*	*4,8042*	*Parrelation*
5	*2*	*T₅*	*20,3790*	*Kultplats*
7	**2**	**T₇**	**25,1832**	**Rit (Rite)**
8	0	8	6,8112	numnaʀ at valrauþu bāðaʀ sãmãn (togs som krigsbyte båda tillsammans)
9	0	9	5,9985	ã ỹmissum mãnnum? (mellan den ena och den andra)
9	**1**	**T₈**	**12,8097**	**Fångtagning (Capture)**
9	*1*	*T₈*	*12,8097*	*Fångtagning*
7	*2*	*T₇*	*25,1832*	*Rit*
9	**2**	**T₉**	**37,9929**	**Krigstradition (War tradition)**
10	0	D	0	
11	0	10	4,1134	Þat sagum ãnnart, (Låt oss för det andra säga detta)
11	**1**	**T₁₀**	**4,1134**	**Påminnelse (Reminder)**
11	*1*	*T₁₀*	*4,1134*	*Påminnelse*
9	*2*	*T₉*	*37,9929*	*Krigstradition*
11	**2**	**T₁₁**	**42,1063**	**Krigshistoria (War history)**
12	0	D	0	
13	0	11	6,0964	urði fiaru meðr hraiðgutum, (förlorade livet österut)
13	**1**	**T₁₂**	**6,0964**	**Österledsförlust (Defeat eastwards)**
13	*1*	*T₁₂*	*6,0964*	*Österledsförlust*
11	*2*	*T₁₁*	*42,1063*	*Krigshistoria*
13	**2**	**T₁₃**	**48,2027**	**Varning (Warning)**
14	0	12	3,9878	dømiʀ æ̃ nn ((dömer / härskar än)

15	0	13	3,2568	umb sakaʀ? (… om / över saker)
15	**1**	**T₁₄**	**7,2446**	**Bestående makt (Power duration)**
15	*1*	*T₁₄*	*7,2446*	*Bestående makt*
13	*2*	*T₁₃*	*48,2027*	*Varning*
15	**2**	**T₁₅**	**55,4473**	**Fruktan (Fear)**
16	0	14	3,9878	Raið iau, (red på hästen)
17	0	15	4,9298	rinkʀ hinn þurmōði, (den djärve krigaren)
17	**1**	**T₁₆**	**8,9176**	**Dristighet (Boldness)**
18	0	16	4,5216	stilliʀ flutna, (männens hövding)
19	0	17	4,9926	strãndu Hraiðmaraʀ. (över horisonten i öster)
19	**1**	**T₁₇**	**9,5142**	**Förädling (Ennoblement)**
19	*1*	*T₁₇*	*9,5142*	*Förädling*
17	*1*	*T₁₆*	*8,9176*	*Dristighet*
19	**2**	**T₁₈**	**18,4318**	**Behärskning (Mastery)**
19	*3*	*T₁₈*	*18,4318*	*Behärskning*
15	*2*	*T₁₅*	*55,4473*	*Fruktan*
19	*3*	**T₁₉**	**73,8791**	**Underkastelse (Subservience))**
20	0	18	4,4588	Sitiʀ nū garuʀ (sitter nu rustad)
21	0	19	5,4180	ã guta sīnum, (på sin häst)
21	**1**	**T₂₀**	**9,8768**	**Stridsberedskap (Combat preparedness)**
21	*1*	*T₂₀*	*9,8768*	*Stridsberedskap*
19	*3*	*T₁₉*	*73,8791*	*Underkastelse*
21	**3**	**T₂₁**	**83,7559**	**Disciplin (Discipline)**
22	0	D	0	
23	0	20	4,8036	fatlaðʀ, skati mǣringa. (beredd, den främsta av de berömda)
23	**1**	**T₂₂**	**4,8036**	**Härförare (Army leader)**
23	*1*	*T₂₂*	*4,8036*	*Härförare*
21	*3*	*T₂₁*	*83,7559*	*Disciplin*
23	**3**	**T₂₃**	**88,5595**	**Ledning (Leadership)**
24	0	D	0	
25	0	21	4,8984	Sagum Ygg minni þat, (Låt oss säga detta som ett minne för Oden)
25	**1**	**T₂₄**	**4,8984**	**Vördnad (Reverence)**
25	*1*	*T₂₄*	*4,8984*	*Vördnad*
23	*3*	*T₂₃*	*88,5595*	*Ledning*
25	**3**	**T₂₅**	**93,4575**	**Respekt (Respect)**
26	0	D	0	
27	0	24	4,1448	Þat sagum tvalfta, (Låt oss för det tolfte säga,)
27	**1**	**T₂₆**	**4,1448**	**Påminnelse (Reminder)**
27	*1*	*T₂₆*	*4,1448*	*Påminnelse*
25	*3*	*T₂₅*	*93,4575*	*Respekt*
27	**3**	**T₂₇**	**97,6023**	**Ritualisering (Ritualizing)**
28	0	25	4,9926	sē gunnaʀ etu vēttvãngi (ser vargen mat (på) slagfältet)
29	0	26	4,1071	ã, (kunungaʀ tvaiʀ tigiʀ svāð ã+liggia (Y)?)(där tjugo kungar ligger)

29	**1**	**T₂₈**	**9,0997**	**Blodbad (Massacre)**	
29	*1*	*T₂₈*	*9,0997*	*Blodbad*	
27	*3*	*T₂₇*	*97,6023*	*Ritualisering*	
29	**3**	**T₂₉**	**106,7020**	**Offrande (Offering to a god, Sacrificing)**	
30	0	D	0		
31	0	28	4,5216	Þat sagum þrēttāunda, (Låt oss för det trettonde säga)	
31	**1**	**T₃₀**	**4,5216**	**Påminnrlse (Reminder)**	
31	*1*	*T₃₀*	*4,5216*	*Påminnelse*	
29	*3*	*T₂₉*	*106,7020*	*Offrande*	
31	**3**	**T₃₁**	**111,2236**	**Blidkande (Appeasing)**	
32	0	29	6,8565	sātin at Sīulundi fiagura vinddura (var på det vidsträckta slagfältet)	
33	0	30	6,9237	at fiagurum nampnum, (med fyra namn)	
33	**1**	**T₃₂**	**13,7802**	**Krigare (Warrior)**	
33	*1*	*T₃₂*	*13,7802*	*Krigare*	
31	*3*	*T₃₁*	*111,2236*	*Blidkande*	
33	**3**	**T₃₃**	**125,0038**	**Inställsamhet (Obsequiousness)**	
34	0	D	0		
35	0	23	7,7558	guldin at kvãnaʀ hūsli? (fick sota för en kvinnas offer)	
35	**1**	**T₃₄**	**7,7558**	**Kvinnooffer (Woman's sacrifice)**	
33	*3*	*T₃₃*	*125,0038*	*Inställsamhet*	
35	*1*	*T₃₄*	*7,7558*	*Kvinnooffer*	
35	**3**	**T₃₅**	**132,7596**	**Gottgörelse (Compensation)**	
36	8	31	5,0868	burniʀ fiagurum brōðrum? (söner till fyra bröder)	
35	8	32	4,0506	Valkaʀ fim, (Fem med namn Valke)	
35	**7**	**T₃₆**	**9,1374**	**Rot** (Stam) **(Root) (Stem)**	
34	8	33	4,4907	Rāðulfs syniʀ, (söner till Rådulv,)	
33	8	34	4,5216	Hraiðulfaʀ fim, (fem med namn Redulv)	
33	**7**	**T₃₇**	**9,0118**	**Släktförgrening (Genealogy)**	
35	*7*	*T₃₆*	*9,1374*	*Rot (Stam)*	
33	*7*	*T₃₇*	*9,0118*	*Släktförgrening*	
33	**6**	**T₃₈**	**18,1492**	**Släktträd (Family tree)**	
32	8	35	4,4902	Rōgulfs syniʀ, (söner till Rogulv)	
31	8	36	4,4274	Hãīslaʀ fim, (fem med namn Håïsl)	
31	**7**	**T₃₉**	**8,9176**	**Släktförgrening (Genealogy)**	
33	*6*	*T₃₈*	*18,1492*	*Släktträd*	
31	*7*	*T₃₉*	*8,9176*	*Släktförgrening*	
31	**6**	**T₄₀**	**27,0668**	**Ätt (Family)**	
30	8	37	4,4588	Haruðs syniʀ, (söner till Hård)	
29	8	38	4,5216	Gunnmundaʀ fim, (fem med namn Gunmund)	
29	**7**	**T₄₁**	**8,9804**	**Släktförgrening (Genealogy)**	
29	*7*	*T₄₁*	*8,9804*	*Släktförgrening*	
31	*6*	*T₄₀*	*27,0668*	*Ätt*	
29	**6**	**T₄₂**	**36,0472**	**Släktkrönika (Family chronicle)**	

28	8	D	0	
27	8	39	4,8042	Bernaʀ syniʀ. (söner (till) Björn)
27	**7**	**T_{43}**	**4,8042**	**Gren (Branch)**
27	7	T_{43}	4,8042	*Gren*
29	6	T_{42}	36,0472	*Släktkrönika*
27	**6**	**T_{44}**	**40,8574**	**Familjeband (Family bond)**
27	6	T_{44}	40,8574	*Familjeband*
35	3	T_{35}	132,7596	*Gottgörelse*
27	**5**	**T_{45}**	**173,6170**	**Samhörighet (Affinity)**
26	8	40	4,1134	Sagum Ygg minni: (Låt oss säga ett minne för Oden)
25	8	41	4,2390	þor! (Törs)
25	**7**	**T_{46}**	**8,3524**	**Maning (Appeal)**
24	8	D	0	
23	8	42	4,3332	Sibi vīaværi? ((Vem är) beskyddare av heliga platser för en broder)
23	**7**	**T_{47}**	**4,3332**	**Gudomlighet (Divinity)**
25	7	T_{46}	8,3524	*Maning*
23	7	T_{47}	4,3332	*Gudomlighet*
23	**6**	**T_{48}**	**12,6856**	**Tillbedjan (Worship)**
23	6	T_{48}	12,6856	*Tillbedjan*
27	5	T_{45}	173,6170	*Samhörighet*
23	**5**	**T_{49}**	**186,3026**	**Symbios (Symbiosis)**
22	8	D	0	
21	8	44	4,5844	Sagum Ygg minni, (Låt oss säga som ett minne för Oden)
21	**7**	**T_{50}**	**4,5844**	**Vördnad (Reverence)**
21	7	T_{50}	4,5844	*Vördnad*
23	5	T_{49}	186,3026	*Symbios*
21	**5**	**T_{51}**	**190,8870**	**Tro (Faith)**
20	8	46	4,0820	burinn niðʀ (fötts en avkomling)
19	8	47	4,3332	‚dræ̃ ngi! (till den unge mannen)
19	**7**	**T_{52}**	**8,4152**	**Ättling (Descendant)**
19	7	T_{52}	8,4152	*Ättling*
21	5	T_{51}	190,8870	*Tro*
19	**5**	**T_{53}**	**199,3022**	**Högättad (Hihgborn)**
18	8	D	0	
17	8	48	4,3332	nē's þat. (det är ingen)
17	**7**	**T_{54}**	**4,3332**	**Bekräftande** (Förnekande av lögn) **(Affirming)** (Denial of lie)
17	7	T_{54}	4,3332	*Bekräftande*
19	5	T_{53}	199,3022	*Högättad*
17	**5**	**T_{55}**	**203,6354**	**Ursprung (Origin)**
16	8	D	0	
15	8	50	4,4274	knātti iatun? (besegra ett monster)
15	**7**	**T_{56}**	**4,4274**	**Styrka (Strength)**

15	*7*	*T_{56}*	*4,4274*	*Styrka*
17	*5*	*T_{55}*	*203,6354*	*Ursprung*
15	**5**	**T_{57}**	**208,0628**	**Källa (Source)**
14	8	51	4,3332	nē's þat. (det är ingen)
13	8	52	3,9250	(H)nit! (Kamp)
13	**7**	**T_{58}**	**8,2582**	**Vilja (Will)**
13	*7*	*T_{58}*	*8,2582*	*Vilja*
15	*5*	*T_{57}*	*208,0628*	*Källa*
13	**5**	**T_{59}**	**216,3210**	**Auktoritet (Authority)**
12	8	D	0	
11	8	27	0,8164	liggia (Y) ? (ligga (Y))
11	**7**	**T_{60}**	**0,8164**	**Anonymitet (Anonymity)**
11	*7*	*T_{60}*	*0,8164*	*Anonymitet*
13	*5*	*T_{59}*	*216,3210*	*Auktoritet*
11	**5**	**T_{61}**	**217,1374**	**Våldsutövning (Violence)**
10	8	D	0	
9	8	43	0,7850	rӯðʀ (Y)? (rödfärgar med blod (Y))
9	**7**	**T_{62}**	**0,7850**	**Död (Death)**
9	*7*	*T_{62}*	*0,7850*	*Död*
11	*5*	*T_{61}*	*217,1374*	*Våldsutövning*
9	**5**	**T_{63}**	**217,9224**	**Förstörelse (Destruction)**
8	8	D	0	
7	8	45	0,7046	sē (är/har…)((H)vaim)+(burinn niðʀ)+(,drӕ̃ngi!) (Åt vem)(har det fötts en avkomling) ((till)den unge mannen)
7	**7**	**T_{64}**	**0,7046**	**Härkomst (Lineage)**
7	*7*	*T_{64}*	*0,7046*	*Härkomst*
9	*5*	*T_{63}*	*217,9224*	*Förstörelse*
7	**5**	**T_{65}**	**218,6270**	**Återskapande (Re-creation)**
6	8	D	0	
5	8	22	-0,0345	vāʀi (fick …(blev tvungen att)+(hvā'ʀ ī gyldinga)+(guldin at kvã̃naʀ hūsli?)(vem som på grund av en varg) (… sota för en kvinnas offer)
5	**7**	**T_{66}**	**-0,0345**	**Vållande (Cause)**
5	*7*	*T_{66}*	*-0,0345*	*Vållande*
7	*5*	*T_{65}*	*218,6270*	*Återskapande*
5	**5**	**T_{67}**	**218,5925**	**Kausalitet (Causality)**
4	8	D	0	
3	8	7	-0,3058	vāʀin (blev (tagna))+))+(svāð tvalf sinnum)+(numnaʀ at valrauþu bāðaʀ sãmãn)+(ã̃ ӯmissum mãnnum?) (som tolv gånger) (båda tillsammans togs som krigsbyte) (mellan den ena och den andra)
3	**7**	**T_{68}**	**-0,3058**	**Cirkulering (Circulation)**
3	*7*	*T_{68}*	*-0,3058*	*Cirkulering*
5	*5*	*T_{67}*	*218,5925*	*Kausalitet*
3	**5**	**T_{69}**	**218,2867**	**Nödvändighet (Necessity)**
2	8	D	0	

1	8	49	-4,07188	Knūā (kunde)+(Villi+nē's þat)+(Villi+nē's þat.)+(knātti iatun?) (det är ingen lögn) (det är ingen lögn) (besegra ett monster)
1	**7**	**T_{70}**	**-4,07188**	**Sanningshalt (Veracity)**
1	*7*	*T_{70}*	*-4,07188*	*Sanningshalt*
	5	*T_{69}*	*218,2867*	*Nödvändighet*
1	**5**	**T_{71}**	**214,21482**	**Äkthet (Authenticity)**

Table A3
Extraction of terms from the O-net: novel proposal of the Rök runestone

X	Y	A-component	O-component	Naming	Fusion
		Pendulum,	*Destination*	*Extraction*	*Värde*
2	1	$T_1: D \to 2$	T_{O1}	Stele (Testamente) (Stele, Testament)	3,0208
3	1	$T_2: D \to 3$	T_{O2}	Minnesmärke (Memorial)	2,0096
6	1	$T_3: D \to 4$	T_{O3}	Monument (Monument)	4,3730
6	2	$T_4: T_{A3} \to T_{A2}$	T_{O2}	Minnesmärke (Memorial)	6,3827
6	3	$T_5: T_{A4} \to T_{A1}$	T_{O5}	Kultplats (Place of worship, Sanctuary)	9,4035
8	1	$T_6: D \to 5$	T_{O4}	Vördnad (Reverence)	3,4088
8	2	$T_7: T_{A6} \to T_{A5}$	T_{O7}	Rit (Rite)	12,8123
10	1	$T_8: D \to 6$	T_{O6}	Parrelation (Binay relation)	4,2704
10	3	$T_9: T_{A8} \to T_{A7}$	T_{O9}	Krigstradition (War tradition)	17,0827
12	1	$T_{10}: 7 \to 8$	T_{O8}	Fångtagning (Capture)	6,2677
14	1	$T_{11}: D \to 9$	T_{O8}	Fångtagning (Capture)	3,9912
14	2	$T_{12}: T_{A11} \to T_{A10}$	T_{O11}	Krigshistoria (War history)	10,2589
14	3	$T_{13}: T_{A12} \to T_{A9}$	T_{O13}	Varning (Warning)	27,3416
16	1	$T_{14}: D \to 10$	T_{O10}	Påminnelse (Reminder)	3,5482
16	3	$T_{15}: T_{A14} \to T_{A13}$	T_{O15}	Fruktan (Fear)	30,8898
18	1	$T_{16}: D \to 11$	T_{O12}	Österledsförlust (Defeat eastwards)	5,0902
18	3	$T_{17}: T_{A16} \to T_{A15}$	T_{O15}	Fruktan (Fear)	35,9794
20	1	$T_{18}: 12 \to 13$	T_{O14}	Bestående makt (Power duration)	7,6714
20	3	$T_{19}: T_{A18} \to T_{A17}$	T_{O19}	Underkastelse (Subservience)	43,6508
22	1	$T_{20}: D \to 19$	T_{o22}	Härförare (Army leader)	3,4606
22	3	$T_{21}: T_{A20} \to T_{A19}$	T_{o21}	Disciplin (Discipline)	46,6624
24	1	$T_{22}: 22 \to 23$	T_{O34}	Kvinnooffer (Woman's sacrifice)	6,3629
24	3	$T_{23}: T_{A22} \to T_{A21}$	T_{o23}	Ledning (Leadership)	53,4753
26	1	$T_{24}: D \to 24$	T_{O26}	Påminnelse (Reminder)	3,5482
26	3	$T_{25}: T_{A24} \to T_{A23}$	T_{o25}	Respekt (Respect)	56,5735
28	1	$T_{26}: 25 \to 26$	T_{o28}	Blodbad (Massacre)	4,3960
28	3	$T_{27}: T_{A26} \to T_{A25}$	T_{o27}	Ritualisering (Ritualizing)	61,4185
30	1	$T_{28}: D \to 27$	T_{o59}	Auktoritet (Authority)	2,8888
30	3	$T_{29}: T_{A28} \to T_{A27}$	T_{O29}	Offrande (Offering, Sacrificing)	64,3073
32	1	$T_{30}: D \to 28$	T_{O30}	Påminnelse (Reminder)	3,5482
32	3	$T_{31}: T_{A30} \to T_{A29}$	T_{o31}	Blidkande (Appeasing)	67,8555
34	1	$T_{32}: 29 \to 30$	T_{O23}	Ledning (Leadership)	5,4950
34	3	$T_{33}: T_{A32} \to T_{A31}$	T_{o33}	Inställsamhet (Obsequiousness)	73,3508
36	1	$T_{34}: 31 \to 32$	T_{o36}	Rot (Root, Stem)	8,9848
38	1	$T_{35}: 33 \to 34$	T_{o37}	Släktförgrening (Genealogy)	8,8948
38	2	$T_{36}: T_{A35} \to T_{A34}$	T_{o35}	Gottgörelse (Compensation)	17,7896
34	7	$T_{37}: 35 \to 36$	T_{o39}	Släktförgrening (Genealogy)	8,8948
34	6	$T_{38}: T_{A37} \to T_{A36}$	T_{o38}	Släktträd (Family tree)	26,6844
32	7	$T_{39}: 37 \to 38$	T_{o41}	Släktförgrening (Genealogy)	8,8948
32	6	$T_{40}: T_{A39} \to T_{A38}$	T_{o40}	Ätt (Family)	35,5792
30	7	$T_{41}: D \to 39$	T_{o43}	Gren (Branch)	4,4474

| 30	6	$T_{42}: T_{A41} \rightarrow T_{A40}$	To_{42}	Släktkrönika (Family chronicle)	40,0266
30	5	$T_{43}: T_{A42} \rightarrow T_{A33}$	To_{44}	Familjeband (Family bond)	113,3774
28	7	$T_{44}: 40 \rightarrow 41$	To_{46}	Maning (Appeal)	8,7920
26	7	$T_{45}: D \rightarrow 42$	T_{O47}	Gudomlighet (Divinity)	4,3960
26	6	$T_{46}: T_{A45} \rightarrow T_{A44}$	To_{44}	Familjeband (Family bond)	13,8018
26	5	$T_{47}: T_{A46} \rightarrow T_{A43}$	To_{44}	Familjeband (Family bond)	126,5654
24	7	$T_{48}: D \rightarrow 43$	To_{61}	Våldsutövning (Violence)	3,5796
24	5	$T_{49}: T_{A48} \rightarrow T_{A47}$	T_{O47}	Gudomlighet (Divinity)	130,1450
22	7	$T_{50}: D \rightarrow 44$	T_{O50}	Vördnad (Reverence)	2,7220
22	5	$T_{51}: T_{A50} \rightarrow T_{A49}$	T_{O51}	Tro (Faith)	132,8670
20	7	$T_{52}: 45 \rightarrow 46$	T_{O52}	Ättling (Descendant)	7,4673
18	7	$T_{53}: D \rightarrow 47$	T_{O52}	Ättling (Descendant)	3,5109
18	6	$T_{54}: T_{A53} \rightarrow T_{A52}$	T_{O52}	Ättling (Descendant)	10,9782
18	5	$T_{55}: T_{A54} \rightarrow T_{A51}$	T_{O53}	Högättad (Highborn)	43,8452
16	7	$T_{56}: D \rightarrow 48$	T_{O54}	Bekräftande (Affirming) (Denial of lie)	3,6110
16	5	$T_{57}: T_{A54} \rightarrow T_{A51}$	T_{O53}	Högättad (Highborn)	147,4562
14	7	$T_{58}: 51 \rightarrow 52$	T_{O58}	Vilja (Will)	7,2220
14	5	$T_{59}: T_{A58} \rightarrow T_{A57}$	T_{O59}	Auktoritet (Authority)	154,6892
12	7	$T_{60}: 14 \rightarrow 15$	T_{O16}	Dristighet (Boldness)	1,9936
10	7	$T_{61}: 16 \rightarrow 17$	T_{O17}	Förädling (Ennoblement)	1,9936
10	6	$T_{62}: T_{A61} \rightarrow T_{A60}$	T_{O60}	Anonymitet (Anonymity)	3,9872
8	7	$T_{63}: D \rightarrow 49$	T_{O71}	Äkthet (Authenticity)	1,5181
8	6	$T_{64}: T_{A63} \rightarrow T_{A62}$	T_{O64}	Härkomst (Lineage)	(L5,5053
8	5	$T_{65}: T_{A64} \rightarrow T_{A59}$	T_{O60}	Anonymitet (Anonymity)	160,1945
6	7	$T_{66}: D \rightarrow 50$	T_{O56}	Styrka (Strength)	-0,8271
4	7	$T_{67}: D \rightarrow 21$	T_{O24}	Vördnad (Reverence)	-1,1696
4	6	$T_{68}: T_{A67} \rightarrow T_{A66}$	T_{O68}	Cirkulering (Circulation)	-1,9967
4	5	$T_{69}: T_{A68} \rightarrow T_{A65}$	T_{O66}	Vållande (Cause)	158,1978
2	7	$T_{70}: 18 \rightarrow 19$	T_{O20}	Stridsberedskap (Combat preparedness)	-15,0908
2	5	$T_{71}: T_{A70} \rightarrow T_{A69}$	T_{O69}	Nödvändighet (Necessity)	143,1070

Appendix 2

Figure 1 *Flow dynamics of traditional proposal of the Rök runestone (I. Bierschenk, 2021)*
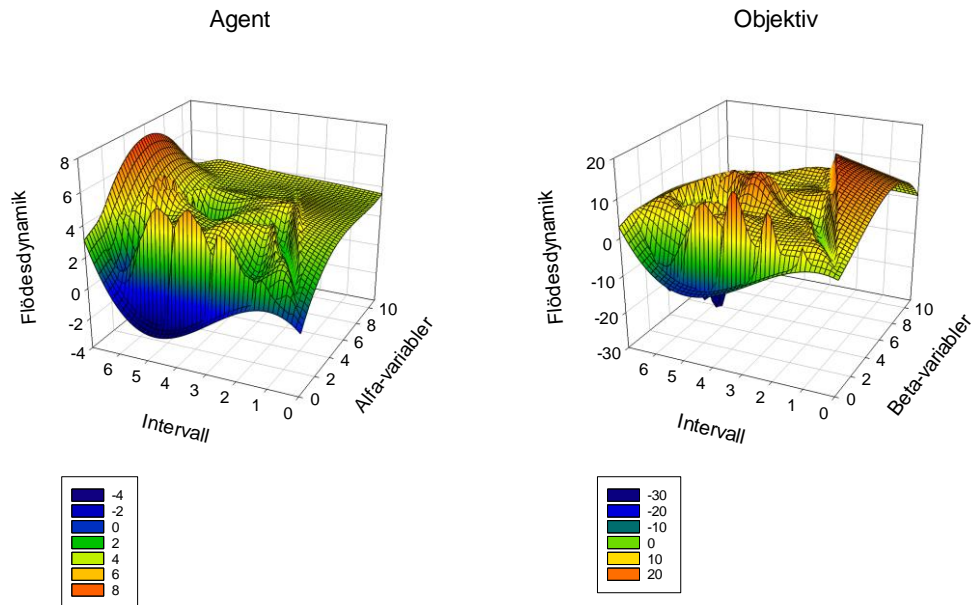
Figure 2 *Fusion dynamics of traditional proposal of the Rök runestone (I. Bierschenk, 2021)*
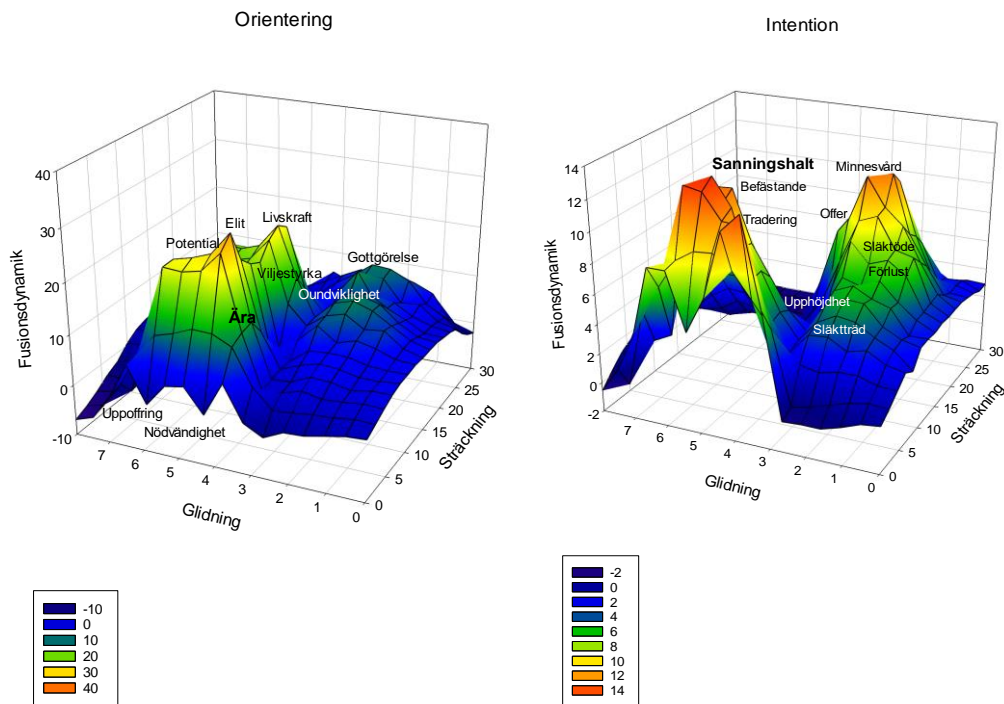
Elit=Elite	Potential=Potential	Befästande=Memorializing	Släktträd=Genealogy
Gottgörelse=Compensation	Uppoffring=Sacrifice	Förlust=Defeat	Släktöde=Family fate
Livskraft=Vitality	Viljestyrka=Willpower	Minnesvård=Memory cherish	Traderng=Tradition
Nödvändighet=Necessity	Ära=Honour	Offer=Victim	Upphöjdhet=Eminence
Oundviklighet=Inevitability		Sanningshalt=Veracity	